

Amendments to the Claims

This listing of the claims will replace all prior versions and listings of the claims in the application.

1. (currently amended) A method comprising:
2 rendering a polygonal mesh to produce a computer-generated image, the
3 image exhibiting aliasing at its discontinuity edges;

4 sorting the discontinuity edges prior to overdrawing; and
5 overdrawing the discontinuity edges as antialiased lines to reduce the
6 aliasing.

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12 2. (original) A method as recited in claim 1, wherein the polygon mesh
13 comprises a set of triangles.

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18 3. (original) A method as recited in claim 1, wherein the image is stored
19 in memory after rendering, and the overdrawing comprises rendering the
20 discontinuity edges as antialiased lines in the memory to reduce the aliasing at the
21 discontinuity edges.

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23
24 4. (original) A method as recited in claim 1, further comprising
25 identifying the discontinuity edges as a collection of silhouettes and sharp edges.

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28 5. (original) A method as recited in claim 1, further comprising:
29 identifying sharp edges prior to said rendering; and

1 finding silhouette edges during runtime, the discontinuity edges being a
2 union of the sharp edges and the silhouette edges.

3
4 6. (original) A method as recited in claim 1, further comprising shading
5 the discontinuity edges.

6
7 7. (original) A method as recited in claim 1, further comprising blending
8 selected discontinuity edges.

9
10 8. (original) A method as recited in claim 1, further comprising
11 orienting the discontinuity edges in a consistent manner.

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13 9. (original) A method as recited in claim 1, further comprising
14 asymmetrically blending selected discontinuity edges.

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16 10. (canceled)

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18 11. (original) One or more computer-readable media comprising
19 computer-executable instructions that, when executed, perform the method as
20 recited in claim 1.

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22 12. (currently amended) A method comprising:
23 determining discontinuity edges of a polygon mesh by identifying sharp
24 edges during a preprocess prior to rendering the polygon mesh and finding
25 silhouette edges during runtime after rendering the polygon mesh; and

1 overdrawing the discontinuity edges as antialiased lines.

2
3 13. (original) A method as recited in claim 12, wherein said determining
4 comprises identifying sharp edges and silhouettes.

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6 14. (canceled)

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8 15. (original) A method as recited in claim 12, further comprising
9 shading the discontinuity edges.

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11 16. (original) A method as recited in claim 12, further comprising
12 blending selected discontinuity edges.

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14 17. (original) A method as recited in claim 12, further comprising
15 asymmetrically blending selected discontinuity edges.

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17 18. (original) A method as recited in claim 12, further comprising
18 orienting the discontinuity edges in a consistent manner.

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20 19. (original) A method as recited in claim 12, further comprising
21 sorting the discontinuity edges prior to said overdrawing.

1 20. (original) One or more computer-readable media comprising
2 computer-executable instructions that, when executed, perform the method as
3 recited in claim 12.

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5 21. (original) In a process for rendering computer-generated graphics, a
6 method comprising:

7 constructing a data structure prior to rendering a polygon mesh; and
8 finding silhouette edges in the polygon mesh during runtime using the data
9 structure; and

10 omitting concave silhouette edges from the data structure.

11

12 22. (original) A method as recited in claim 21, further comprising
13 overdrawing the silhouette edges as antialiased lines.

14

15 23. (original) A method as recited in claim 21, further comprising
16 shading the silhouette edges.

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18 24. (original) A method as recited in claim 21, further comprising
19 blending selected silhouette edges.

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21 25. (original) A method as recited in claim 21, further comprising
22 asymmetrically blending selected silhouette edges.

1 26. (original) A method as recited in claim 21, further comprising
2 sorting the silhouette edges.

3
4 27. (original) One or more computer-readable media comprising
5 computer-executable instructions that, when executed, perform the method as
6 recited in claim 21.

7
8 28. (currently amended) In a process for rendering computer-generated
9 graphics, a method comprising:

10 identifying sharp edges prior to runtime;
11 constructing a data structure prior to rendering a polygon mesh;
12 finding silhouette edges in the polygon mesh during runtime using the data
13 structure; and
14 collecting the sharp edges and the silhouette edges in a list ~~to form~~ of
15 discontinuity edges of the polygon mesh.

16
17 29. (original) A method as recited in claim 28, further comprising
18 shading the discontinuity edges.

19
20 30. (original) A method as recited in claim 28, further comprising
21 blending selected discontinuity edges.

22
23 31. (original) A method as recited in claim 28, further comprising
24 asymmetrically blending selected discontinuity edges.

1 32. (original) A method as recited in claim 28, further comprising
2 sorting the discontinuity edges.

3
4 33. (original) One or more computer-readable media comprising
5 computer-executable instructions that, when executed, perform the method as
6 recited in claim 28.

7
8 34. (original) A method comprising:
9 rendering a polygonal mesh;
10 determining discontinuity edges of the polygon mesh;
11 sorting the discontinuity edges according to visibility; and
12 overdrawing the discontinuity edges in an order resulting from said sorting.

13
14 35. (original) A method as recited in claim 34, wherein said determining
15 comprises:

16 identifying sharp edges prior to said rendering; and
17 finding silhouette edges during runtime, the discontinuity edges being a
18 union of the sharp edges and the silhouette edges.

19
20 36. (original) A method as recited in claim 34, wherein said sorting
21 comprises sorting the discontinuity edges according to depth.

22
23 37. (original) A method as recited in claim 34, wherein said
24 overdrawing comprises overdrawing the discontinuity edges as antialiased lines.

1 38. (original) A method as recited in claim 34, further comprising
2 shading the discontinuity edges.

3
4 39. (original) A method as recited in claim 34, further comprising
5 blending selected discontinuity edges.

6
7 40. (original) A method as recited in claim 34, further comprising
8 asymmetrically blending selected discontinuity edges.

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10 41. (original) A method as recited in claim 34, further comprising
11 orienting the discontinuity edges in a consistent manner.

12
13 42. (previously presented) One or more computer-readable media
14 comprising computer-executable instructions that, when executed, perform the
15 method as recited in claim 34.

16
17 43. (currently amended) A method comprising:
18 rendering a polygonal mesh;
19 identifying one or more silhouette edges of the polygon mesh for a given
20 viewpoint by constructing a data structure prior to rendering the image and finding
the silhouette edges during runtime using the data structure;
21 storing the silhouette edges in an output list; and
22 overdrawing the silhouette edges as antialiased lines.

1 **44. (canceled)**

2
3 **45. (original) A method as recited in claim 43, further comprising**
4 **shading the silhouette edges.**

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6 **46. (original) A method as recited in claim 43, further comprising**
7 **sorting the silhouette edges prior to said overdrawing.**

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9 **47. (original) One or more computer-readable media comprising**
10 **computer-executable instructions that, when executed, perform the method as**
11 **recited in claim 43.**

12
13 **48. (original) A method comprising:**

14 A. during a preprocess phase, performing the following:

15 **identifying sharp edges present in a polygon mesh used to generate a**
16 **graphical image;**

17 **constructing a data structure to store possible silhouette edges**
18 **identified during a subsequent runtime phase;**

19 B. during the runtime phase, performing the following:

20 **rendering the polygonal mesh to produce a rendered image;**

21 **identifying silhouette edges that occur from a given viewpoint of the**
22 **rendered image using the data structure, the silhouette edges together**
23 **with the sharp edges forming a set of discontinuity edges;**

24 **shading the discontinuity edges;**

25 **sorting the discontinuity edges; and**

overdrawing the discontinuity edges as antialiased lines.

49. (original) A method as recited in claim 48, wherein the sorting comprises sorting the discontinuity edges according to depth.

50. (original) A method as recited in claim 48, wherein the shading comprises asymmetrically shading the discontinuity edges.

51. (original) A method as recited in claim 48, wherein the shading comprises applying blending processes that balance temporal smoothness and spatial sharpness.

52. (original) A method as recited in claim 48, wherein the shading comprises orienting the discontinuity edges in a consistent manner.

53. (currently amended) A graphics computing device comprising:
a memory to store a polygon mesh; and
a processing unit to render the polygon mesh, the processing unit being further configured sort the discontinuity edges and then [[to]] overdraw the discontinuity edges of the polygon mesh as antialiased lines.

54. (original) A graphics computing device as recited in claim 53,
wherein the polygon mesh comprises a set of triangles.

1 55. (original) A graphics computing device as recited in claim 53,
2 wherein the processing unit is configured to detect the discontinuity edges as a
3 collection of sharp edges and silhouettes.

4
5 56. (original) A graphics computing device as recited in claim 53,
6 wherein the processing unit comprises:

7 a central processing unit configured to detect the discontinuity edges; and
8 a graphics processing unit configured to render the polygon mesh and to
9 overdraw the discontinuity edges.

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11 57. (original) A graphics computing device as recited in claim 53,
12 further comprising a frame buffer to store the rendered mesh, the processing unit
13 being configured to render the discontinuity edges as antialiased lines in the frame
14 buffer.

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16 58. (original) A graphics computing device as recited in claim 53,
17 wherein the processing unit is further configured to shade the discontinuity edges.

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19 59. (original) A graphics computing device as recited in claim 53,
20 wherein the processing unit is further configured to blend selected discontinuity
21 edges.

1 60. (original) A graphics computing device as recited in claim 53,
2 wherein the processing unit is further configured to orient the discontinuity edges
3 in a consistent manner.

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5 61. (original) A graphics computing device as recited in claim 53,
6 wherein the processing unit is further configured to asymmetrically blend selected
7 discontinuity edges.

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9 62. (canceled)

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11 63. (currently amended) A graphics processing system comprising:
12 a renderer configured to render a polygon mesh;
13 a discontinuity edge detector configured to detect discontinuity edges in the
14 polygon mesh;
15 an edge sorter to sort the discontinuity edges according to depth; and
16 an overdrawer configured to overdraw the discontinuity edges as antialiased
17 lines to reduce the aliasing.

18
19 64. (original) A graphics processing system as recited in claim 63
20 further comprising:
21 a data structure; and
22 the discontinuity edge detector being configured to find silhouette edges in
23 the polygon mesh using the data structure.

1 65. (original) A graphics processing system as recited in claim 63
2 wherein the discontinuity edge detector is further configured to identify sharp
3 edges of the polygon mesh prior to rendering the polygon mesh.

4

5 66. (canceled)

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7 67. (original) A graphics processing system as recited in claim 63
8 further comprising a shading module to shade the discontinuity edges using
9 asymmetric blending.

10

11 68. (original) A graphics computing device comprising the graphics
12 processing system as recited in claim 63.

13

14 69. (currently amended) One or more computer-readable media
15 comprising computer-executable instructions that, when executed, direct a
16 graphics computing device to:

17 render a polygonal mesh;

18 detect discontinuity edges in the polygon mesh;

19 sort the discontinuity edges according to depth; and

20 overdraw the discontinuity edges as antialiased lines to reduce the aliasing.

21

22 70. (original) One or more computer-readable media as recited in claim
23 69, further comprising computer-executable instructions that, when executed,
24 direct the graphics computing device to:

25 identify sharp edges prior to rendering the polygon mesh; and

1 find silhouette edges after rendering the polygon mesh, the discontinuity
2 edges being a union of the sharp edges and the silhouette edges.

3
4 71. (original) One or more computer-readable media as recited in claim
5 69, further comprising computer-executable instructions that, when executed,
6 direct the graphics computing device to shade the discontinuity edges.

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8 72. (canceled)

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10 73. (original) One or more computer-readable media as recited in claim
11 69, further comprising computer-executable instructions that, when executed,
12 direct the graphics computing device to:

13 orient the discontinuity edges in a consistent manner; and
14 blend the discontinuity edges using asymmetric blending.

15
16 74. (previously presented) A system comprising:
17 means for identifying sharp edges present in a polygon mesh;
18 means for rendering the polygonal mesh to produce a rendered image;
19 means for identifying silhouette edges that occur from at least one
20 viewpoint of the rendered image;
21 means for shading the sharp edges and the silhouette edges;
22 means for sorting the sharp edges and the silhouette edges; and
23 means for overdrawing the sharp edges and the silhouette edges as
24 antialiased lines.